Atmospheric transport and chemistry of trace gases in LMDz5B

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Atmospheric transport and chemistry of trace gases in LMDz5B: evaluation and implications for inverse modelling

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SUPPLEMENTARY MATERIALS

Three figures are added here. Figure 1 illustrates the sensitivity of ^{222}Rn concentrations to the vertical diffusion scheme at Heidelberg. Figure 2 shows the action of the thermal plume model on the vertical distribution of ^{222}Rn concentrations. Figure 3 illustrates the sensitivity of the NP version of LMDz to external meteorological forcings by showing comparisons of two-metres temperatures simulated by NP and TD with ERA-Interim reanalysis.

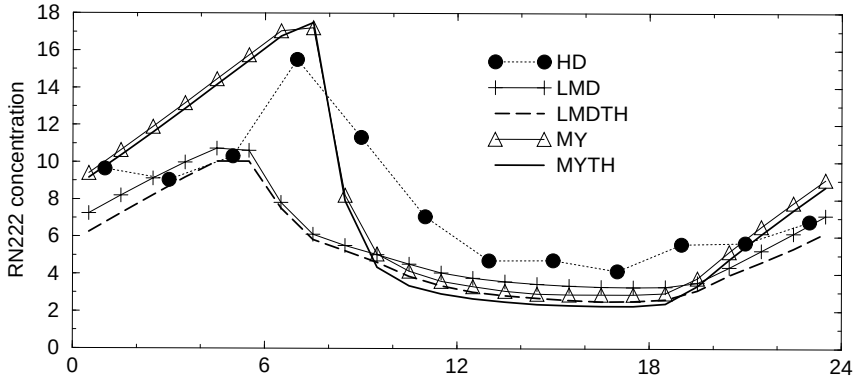

Figure 1: Mean ^{222}Rn diurnal cycle at Heidelberg in the beginning of August 1998. LMD refers to Louis (1979) only ; LMDTH refers to Louis (1979) combined with the thermal plume model ; MY refers to Yamada et al. (1983) only ; MY refers to Yamada et al. (1983) combined with the thermal plume model. HD is the observations at Heidelberg.

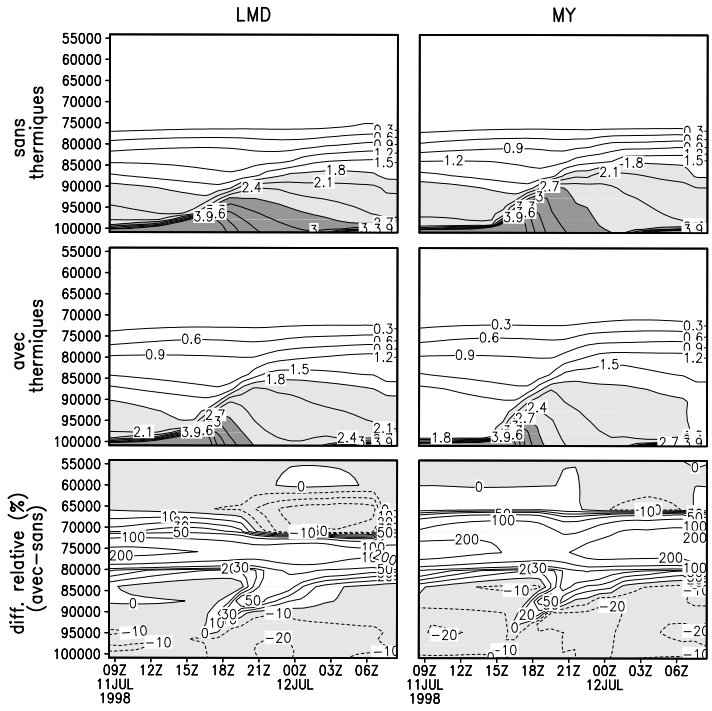

Figure 2: Mean diurnal cycle of ^{222}Rn vertical profile simulated over Heidelberg. Right and left panels respectively refer to simulations using Yamada et al. (1983) and Louis (1979) schemes. Middle and top panels respectively refer to simulations using and not using the thermal plume model. Bottom panels is the relative difference between simulations using the thermal plume model and simulations not using the thermal plume model (in percentage).

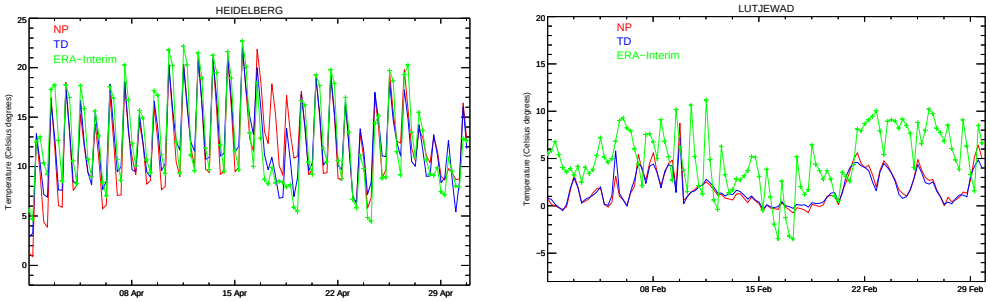

Figure 3: Comparison of temperature at two-metres between NP (red), TD (blue) simulations and ERA-Interim reanalysis (green) at Heidelberg in April 2009 (left) and at Lutjewad in February 2008 (right).